

MYP topic	Maths HL topic
Number	
Forms of numbers: integers, fractions, decimals, exponents, standard form (scientific notation) and surds/radicals	PK Forms of numbers: integers, fractions, decimals, exponents, standard form (scientific notation) and surds/radicals
Number systems: set of positive integers and zero (N), integers (Z), rationals (Q), irrationals (Q') and real numbers (R)	PK Number systems: natural numbers; integers, \mathbb{Z} ; rationals, \mathbb{Q} , and irrationals; real numbers, \mathbb{R} .
The four number operations	PK Routine use of addition, subtraction, multiplication and division using integers, decimals and fractions, including order of operations.
Prime numbers and factors including greatest common divider and least common multiples	PK Prime numbers and factors, including greatest common factors and least common multiples.
Number lines	PK Intervals on the real number line using set notation and using inequalities. Expressing the solution set of a linear inequality on the number line and in set notation.
Estimation	PK Rounding, decimal approximations and significant figures.
Units of measurement	
Ratio percentage, direct and inverse proportion	PK Simple applications of ratio, percentage and proportion, linked to similarity.
Number sequences	
Extended maths	
Fractional exponents	1.2 Laws of exponents.
Absolute and percentage error in estimations	PK appreciation of errors

Algebra	
Algebraic manipulations Addition, subtraction, multiplication and division of algebraic terms Factorization of linear and quadratic expressions Substitution Rearranging algebraic expressions Algebraic fractions	PK Basic manipulation of simple algebraic expressions involving factorization and expansion. PK Rearrangement, evaluation and combination of simple formulae. Examples from other subject areas, particularly the sciences, should be included. PK Addition and subtraction of algebraic fractions with denominators of the form $ax + b$.
Integer exponents (including negative number exponents)	PK Simple positive exponents.
Patterns and sequences	
Functions; types of functions: linear, quadratic domain and range	PK The linear function $x \mapsto ax + b$ and its graph, gradient and y-intercept.
Graphs	2.2 The graph of a function; its equation $y = f(x)$.
Equations: linear simultaneous quadratic	PK Solution of equations in one variable, including cases with rational coefficients PK Solution of simultaneous equations in two variables.
Inequalities	PK Solution of inequalities in one variable, including cases with rational coefficients.
Extended maths	
Fractional exponents Logarithms with different base numbers (including natural logarithms)	1.2 Exponents and logarithms. Laws of exponents; laws of logarithms. Change of base.
Functions and graphs: Types of functions: trigonometric, exponential, logarithmic, reciprocal function ($f(x) = 1/x$ and their transformations), the square root function Inverse and composite function Equations involving the functions above	PK Mappings of the elements of one set onto or into another, or the same, set. 2.1 Concept of function $f : x \mapsto f(x)$: domain, range; image (value). 2.4 The reciprocal function 2.5 The quadratic function $x \mapsto ax^2 + bx + c$: its graph. 2.7 The function: $x \mapsto a^x$. The inverse function $x \mapsto \log_a x$ 2.8 The exponential function The logarithmic function. 3.4 The circular functions $\sin x$, $\cos x$ and $\tan x$; their domains and ranges; their periodic nature; their graphs Composite functions; identity function. Inverse function.
Inequalities	
Arithmetic and geometric series	1.1 Arithmetic sequences and series; sum of finite arithmetic series; geometric sequences and series; sum of finite and infinite geometric series.
Matrices	4.1 Definition of a matrix: the terms “element”, “row”, “column” and “order”. 4.2 Algebra of matrices: equality; addition; subtraction; multiplication by a scalar. Multiplication of matrices. Identity and zero matrices. 4.3 Determinant of a square matrix. Calculation of 2×2 and 3×3 determinants. Inverse of a 2×2 matrix..

Geometry and trigonometry	
Geometrical elements and their classification	PK Elementary geometry of the plane including the concepts of dimension for point, line, plane and space. Parallel and perpendicular lines, including $m_1 = m_2$, and $m_1 m_2 = -1$. Geometry of simple plane figures. The function $x \mapsto ax + b$: its graph, gradient and y-intercept.
Distance	PK Distance between two points in the Cartesian plane.
Angle properties	PK Angle measurement in degrees. Compass directions and bearings. Right-angle trigonometry. Simple applications for solving triangles.
Triangle properties	PK Pythagoras' theorem and its converse.
Perimeter/area/volume	PK Perimeter and area of plane figures. Triangles and quadrilaterals, including parallelograms, rhombuses, rectangles, squares, kites and trapeziums (trapezoids); compound shapes.
The Cartesian plane	PK The Cartesian plane: ordered pairs (x, y) , origin, axes.
Trigonometric ratios in right angled triangles	PK Right-angle trigonometry. Simple applications for solving triangles.
Constructions	
Simple isometric transformation	PK Simple geometric transformations: translation, reflection, rotation, enlargement. Congruence and similarity, including the concept of scale factor of an enlargement.
Loci	
Extended maths	
Vectors and vectors spaces	5.1 Vectors as displacements in the plane and in three dimensions. Components of a vector; column representation.. Algebraic and geometric approaches to the following topics: the sum and difference of two vectors; the zero vector, the vector $-\mathbf{v}$; multiplication by a scalar, $k\mathbf{v}$;
Similarity and congruence of theorems	
Trigonometric ratios for angles bigger than 90° Sine and cosine rules	3.6 Solution of triangles. The cosine rule:. The sine rule:.

Statistics and probability	
Graphical analysis and representation (pie charts, histograms, line graphs)	PK Descriptive statistics: collection of raw data, display of data in pictorial and diagrammatic forms (for example, pie charts, pictograms, stem and leaf diagrams, bar graphs and line graphs).
Population sampling	6.1 Concepts of population, sample, random sample and frequency distribution of discrete and continuous data.
Measures of central tendency /location (mean, median, quartile, percentile)	PK Calculation of simple statistics from discrete data, including mean, median and mode. 6.3 Mean, median, mode; quartiles, percentiles. 6.4 Cumulative frequency; cumulative frequency graphs; use to find median, quartiles, percentiles.
Measures of dispersion (range, inter-quartile range)	6.3 Range; inter-quartile range; variance.
Probability of an event Probability of exclusive and combined events Probability of successive trials	6.5 Concepts of trial, outcome, equally likely outcomes, sample space (U) and event. The probability of an event A as $\frac{n(A)}{n(U)}$. Combined events, mutually exclusive events.
Extended maths	
Normal distribution and standard deviation Binomial distribution	6.3 Standard deviation. 6.11 Normal distribution. Properties of the normal distribution. Standardization of normal variables. 6.10 Binomial distribution. Mean of the binomial distribution.
Linear regression Correlation	
Condition probability	6.7 Conditional probability.

Discrete Mathematics	
Sets Venn diagrams	PK Concept and notation of sets. Venn diagrams. 6.8 Use of Venn diagrams, tree diagrams and tables of outcomes to solve problems
Logic	PK The properties of order relations: $<, \leq, >, \geq$.
Networks (including trees)	Option: Discrete Mathematics: 11.6 Graphs, vertices, edges. Properties of graphs.
Algorithm	Option: Discrete Mathematics: 11.1 Euclidean algorithm 11.9 Graph algorithms.
Topology	
Directed networks	
Codes and Ciphers	